DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

10 May 2006

88 ABW/CEV
5490 Pearson Road
Wright-Patterson AFB, OH 45433-5332

Harry R. Steinmetz (3HS62)
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Sir

We are in receipt of U.S. EPA letter dated, 18 April 2006, regarding "Required Submission of Information, Safety Light Corporation Site, Bloomsburg, Pennsylvania" to Wright-Patterson Air Force Base, Environmental Management Division. The answers to the questionnaire are attached.

If you have any questions, do not hesitate to contact me at (937) 257-2121 or Mr. Chris Anthony at (937) 257-5865.

Sincerely

Mark L Mays

MARK L. MAYS
Chief, Environmental Management Division

Attachments:
1. Questionnaire and Answer Sheet
2. RHC Meeting Minutes
3. Disposal Record

cc:
88 ABW/JAE

QUESTIONAIRE AND ANSWER SHEET

1. **Describe in detail the business relationship between WPAFB and Safety Light.**

   The entire past business relationship between Safety Light and any of their subsidiary companies (Site) with Wright-Patterson AFB is not fully known considering the inquiry is concerned with items greater than 44 years old and older. However, three ledger documents were provided that indicated Wright-Patterson AFB purchased radioactive materials from the Site. The intent of this document is to provide necessary information that would pertain to the purchase and disposition of the radioactive materials you have requested without regard to past business relationships.

2. **Did WPAFB ever transport and/or broker hazardous substances and/or radioactive waste or other wastes that were disposed of or reclaimed by U.S. Radium, Lime Ridge Industries, USR Metals, Metreal or Isolite to the Site?**

   Not to the best of our knowledge. An extensive research of past documents has generated a specific summary and conclusion of the findings for each radioisotope contained in the ledger sheets provided.

   a. Cobalt 60 (^{60}Co)

      Safety Light Ledger Information

      Authorization 33313 June 20, 1955, Expiration September 30, 1956 for 20,000 Ci

      January 16 – 2500 Ci – Slug Form, P-57703-1, SpA 1.0 – 350 slugs

      May 25 – 5400 Ci – Slug Form, P-57703-2

      October 1 – 2700 Ci and 8400 Ci (Total 11,100 Ci) – Slug Form

      Total Activity Received 19,000 Ci

      WADC Materials Laboratory Attn: Lt. M. Atkins

      Information gathered from the Wright-Patterson Radiological Health Committee (RCH) Meeting Minutes is provided.

      Summary: The initial approval for the purchase of 15,000 curies (Ci) of ^{60}Co occurred, 11 April 1955. The delivery was to be made in three lot shipments. No other information is available concerning the receipt of the material, but it is assumed that the 19,000 Ci of ^{60}Co were received by Wright-Patterson as indicated by the ledger entries.

      Conclusion: During April 1970, 10,000 Ci of ^{60}Co was removed from the Gamma Irradiation Facility, Building 433, Area B and moved to the Bulk Shield Facility in the Air Force Nuclear Engineering Test Facility, Building 470, Area B. This material was eventually disposed, during the decommissioning of the Test Facility, in June 1971. A disposal record from the Nuclear Engineering Company, Inc., Morehead, KY (Maxey Flats) is provided.

   b. Strontium 90 (^{90}Sr)

      Safety Light Ledger Information

Authorization 33180 May 16, 1955, Expiration December 31, 1956 for 25.0 mCi

March 4, 1956 – P-52335-1, Isolites, 361 – 0.3 mCi / 388-392 – 6 mCi Total / 393 – 18 mCi. Total activity 24.3 mCi.

Authorization 36815, October 21, 1955, Expiration March 31, 1957 for 20 mCi

May 23, 1956 – 3 Isolites, P-54019-1, 3 G.P.L. Heated Light Sources.

Information gathered from the Wright-Patterson Radiation Health Committee Meeting Minutes is provided.

Summary: A request for 20 millicuries (mCi) of ^{90}Sr sealed light sources was approved for purchase on, 21 July 1955. These markers were to be used on all aircraft, specifically the B-52 and C-123. It was recommended that all light sources be procured by one installation. No other information is available as to which installation was to be the primary location of procurement. During August 1956, the RHC approves the retention of the "Isolite" light sources thus removing any return to manufacturer options for disposal.

Conclusion: No definitive disposal records were found that would indicate these items were either disposed in a licensed burial site or returned to the Site. Through the RHC records it was decided that these lights would be retained by the user versus return to Safety Light. Therefore, it is reasonable to state that these items are quite possibly still in use and have never been turned over for disposal or the lights were turned into the then Base Radiation Safety Officer for disposal.

c. Polonium 210 (210Po)

Safety Light Ledger Information

October 12, 1962 – 1 piece foil ¼ X 1 X Po5000, BL 059991, e.o. (33-601)-63-2825, 1.25 mCi

Information gathered from the RHC Meeting Minutes is provided.

Summary: The RHC approves the purchase of 1.25 mCi source of ^{210}Po. No documentation is available as to the use of this source.

Conclusion: There is only one mention as to the purchase of a 1.25 mCi source; no source of distributor was given. However, given the extreme short half life (138.38 days) of the material and the length of time between the purchase and this inquiry (43.5 years), the approximate remaining activity of the source is 3.47×10^{-32} μCi (3.47×10^{-20} attocuries or approximately 7.7×10^{-26} dpm). This minute quantity remaining is impossible to detect with any laboratory instrument available today. Therefore, this radioisotope should not be considered a source of public exposure.

3. Answer to Question 2 was no; therefore, an answer is not requested.

4. Did the WPAFB ever generate radioactive wastes or other wastes that were disposed of or reclaimed by U.S. Radium, Lime Ridge Industries, USR Metals, Metreal or Isolite at the Site?

No Details are contained in answer to question 2.

5. **Answer to Question 4 was no; therefore, an answer is not requested.**

6. **If you have reason to believe there may be persons able to provide more detailed or complete responses to any question contained herein, or who may be able to provide additional responsive documents, provide names, titles, areas of responsibility, current addresses, and telephone numbers of such persons as well as additional information or documents they may have.**

   None known.

7. **For each an every question contained herein, if information or documents responsive to this Information Request are not in your possession, custody, or control, then provide the names, titles, areas of responsibility, current addresses, and telephone numbers of the persons from whom such information or documents may be obtained.**

   None known.

8. **If you have any other information about other party(ies) who may have information that may assist the Agency in its investigation of the Site, or who may be responsible for the generation of, transportation to, or release of contamination at the Site, please provide such information. The information you provide in response to this request should include the party's name, address, type of business, and the reasons why you believe the party may have contributed to the contamination at the Site or may information regarding the Site.**

   None known.

9. **If any of the documents solicited in this information request are no longer available, please indicate the reason why they are no longer available. If pertinent records or documents were destroyed or are missing, provide us with the following:**

   Supporting documentation is being provided.

-- END --

RADIOLOGICAL HAZARDS ADVISORY COMMITTEE

Minutes of First Special Meeting 11 April 1955

The first special meeting of the reorganized Radiological Hazards Advisory Committee was held in the Surgeon's Office, Hq AMC, Bldg. 262 on 11 April 1955.

Committee Members Present:

Lt. Col Jack C. Carmichael	Engineering Section, Office of the Surgeon, Hq AMC
Mr. Thomas H. Colling	Plans and Coordination Office, Hq WPAFB
Dr. William J. Price	Physics Dept., Institute of Technology
Lt. E. A. Burke(Secretary)	Materials Laboratory, WADC

Members of Other Organizations Present:

Major Harlan W. Gessner	Materials Laboratory, WADC
Lt. Ma rvin C. Atkins	Materials Laboratory, WADC
Mr. Robert D. Thomas	Materials Laboratory, WADC

The following is a record of actions taken and business transacted at this meeting:

I. Standby Power for Bldg 433 Area B:

1. The Analysis and Measurement Branch had submitted to the Directorate of Base Installations a work order request to furnish standby power for the air conditioning blowers and power roof ventilators in Bldg 433. The work order request was returned by Base Installations with a request for further justification. For this reason the Analysis and Measurement, requested, per DF dated 8 April 55, that the Committee express its opinion as to the desireability of installing standby power.

2. The following points relative to the installation of standby power were established to the satisfaction of Committee members:

   a. There are several sources of radioactive dust and gas in Bldg 433 at the present time.

   b. Certain of these sources release gas and dust continuously because of their inherent physical properties.

   c. The quantity and potency of such sources is expected to steadily increase in the coming months.

d. Protection of personnel and the prevention of damage to facilities and equipment depends soley on maintenance of continuous ventilation.

e. There are no other effective methods for preventing injury to personnel or damage to equipment; for example, no suitable warning devices exist.

f. In the event ventilation should fail, all personnel in the building would be exposed to some degree. This possibility involves, not only users of the radioactive sources and other regular occupants at the building, but also extends to visitors, contractors, police, and Installations personnel, some of whom have occasion to visit the building after normal duty hours.

g. Exposure of personnel would normally require their removal from all work involving radiation sources for periods ranging from weeks to months. In some cases, removal would have to be permanent. This would have a crippling effect on the accomplishment of projects involving use of radiation sources.

h. Uncontrolled release of gas and dust, due to power failure, could result in gross contamination of large portions or all of Building 433 necessitating the initiation of drastic, costly, and hazardous decontamination procedures.

3. In view of the above factors, it was the unanimous opinion of the Committee that standby power should be available in Building 433 in order that continuous ventilation can be maintained.

II. 15,000 Curie Cobalt-60 Source:

1. A request for 15,000 curies of Cobalt-60 had been submitted to the Committee at its regular meeting of 29 March 1955 by the Analysis and Measurement Branch. At that time the Committee voted to hold the request pending the submission of more detailed information by representatives of the Analysis and Measurement Branch. The special meeting was called for the purpose of reviewing this additional information.

2. Lt. Atkins of the Analysis and Measurement Branch described in detail the construction of the Cobalt source, its preposed use, and the Radiological hot cell in which it would be used. The following topics were covered to the satisfaction of the Committee:

a. Manipulation of the source within the hot cell.
b. Observation of the source while in use.
c. Possible corrosion of the source when stored in water well.
d. Shielding of the source.
e. Magnitude of scattered gamma radiation through the roof of the hot cell.

f. Construction specifications of the hot cell.
g. Ventilation in the hot cell.
h. Transportation and installation of the source.
i. Procedure to be followed in the event the cell is incomplete when the source is made available by the supplier.
j. Controls imposed on source users.
k. Atomatic warning devices.
l. Procedures to be followed in the event of enemy attack or other emergency.

3. The following specific information was ascertained:

a. Construction of the hot cell will begin by 1 July 1955 and will definitely be completed by the end of 1955 if not sooner.

b. The cobalt will be shipped in three lots. The first lot will not be available for shipment until September 1955.

4. Lt Atkins stated that the source will eventually be transferred to a special kilocurie facility to be located outside Bldg 433. Construction details of this facility were also presented.

5. The Committee voted for approval of the request.

7. Other Business:

1. A suggestion was made that each member appoint one of more alternates in order to insure full representation at every meeting. Suggestion carried.

2. Lt Burke mentioned that the Aeromedical Laboratory is currently planning to install a radioactive tracer laboratory for animal studies. Representatives of that laboratory have expressed a desire to have their plans reviewed by a responsible group in order to insure safe design. The Committee voted to review their plans, probably at its next regular meeting.

3. Tenative date for next regular meeting is 13 May 1955.

Adopted 13 May 1955
Edward A. Burke 1/Lt USAF (MSC)
Secretary.

Minutes of the 75th Meeting
of the
Base Radiological Hazards Committee

1. The Base Radiological Hazards Committee met in the Conference Room, Building 10, Area C, at 1330 on 2 April 1970. The following members were present:

Lt Colonel William R. Dybvad (Chairman)	EWT
Mr. J. W. Lewis (Secretary)	HWOBH
Dr. S. Gilbert, Jr. (Member)	HWD
Dr. Hans Hennecke (Member)	ARP
Capt M. G. Myers (Visitor)	HWOB
Mr. Anthony Fasano (Member)	AFIT-A FNEC
Dr. Paul Polishuk (Member)	FDP

2. Items of business conducted were as follows:

a. Mr. Lewis advised the Committee that Dr. Sylvan Eller has accepted a position with Mercy Hospital in Springfield; and that Dr. David Lintz was caught in the reduction-in-force and has assumed the responsibilities of Radiological Surveillance of the Southwest District of Ohio under the State Health Department. He further advised that the slot vacated due to the untimely death of Mr. Kirk was cancelled. Capt Woodhouse is picking up Mr. Kirk's load. Currently the X-ray Surveillance Program at Wright-Patterson is being reevaluated and updated. There are approximately 150 x-ray ~~units~~ users on base. Next Month Capt Woodhouse will be receiving indoctrination on x-ray surveillance. The plans for his replacement in the future are not known. Mr. Lewis added that he felt that the Health Physics Unit should be expanded, as is the workload, but that is for higher management to decide. Col Dybvad advised that the way the Committee would have to address the situation is that there are going to be reductions and as long as it does not effect the operation, we as a Committee, will not necessarily get involved. He further advised, however, that he would get involved as Chairman if it gets to the point where it effects the safety of Wright-Patterson employees.

b. Review of Old Business:

(1) Reference RHC 68-20. The new 72,280 curies (now 64,000) of Co^{60} sources transferred from Batelle Memorial to NEC, Bldg 433, Area B have arrived. Mr. Lewis advised we are having a little difficulty with potential contamination of the source. Some are either leaking or are contaminated. NEC is currently pulling these units individually, checking and cleaning them in the hot cell, to see if there is a leak or contamination. Approximately 10,000 curies of Co^{60} (old source) has been removed from Bldg 433. It must now be removed from the inventory, as it is surplus to the needs of the facility and to the Base. At this committee meeting to finalize RHC 68-20, we should consider or recommend disposition of the 10,000 curies of

surplus Co^{60}. We have two proposals-- one from Louisiana Technical Institute, Mr. Kilgore. Their proposal was that they would take the material if we would transfer it to them and pay the shipping costs. They have no funds available to pay these costs. Mr Lewis replied to his letter informing them that the Committee had no jurisdiction over AF funds, and requested that he send to us, prior to final consideration, a copy of his license insuring us that he was eligible to possess this material. He has not replied. In the meantime Mr. Bauer of NEC, had informed us that the West Virginia University was interested in acquiring this same source. They will pay shipping charges and have sent a copy of their license showing that they are eligible receivers. The Committee recommended that Mr. Lewis advise SAAMA of this surplus, that we know of no DOD agency or unit that would need it, and request disposition instructions. Also, include the information we have on the potential recipients.

(2) RHC 69-42, par 2.c.(27) of 22 Oct 69 minutes. Mr. Lewis received approval from the individual members via telephone to proceed on this. HRG has requested a requirement for the next two years. Our broad license allows us up to 5 curies of elements from Hydrogen to Bismuth. They have asked for 3 millicuries of any isotope between 3 and 83. This is a reasonable request. They have presented to Mr. Lewis acceptable operating procedures. The primary user will be a Health Physicst, Captain or above. Mr. Lewis added that this is one of the areas where he intends to place some of the responsibility on the individuals in the organizations that have the capability of handling their own program. According to regulation we have to maintain surveillance over their laboratories periodically, which would be a semi-annual survey. This procedure will help some in reducing the workload in the Health Physics unit. Item approved as discussed.

(3) RHC 69-21, par 2.c.(7) of 22 Oct 69 minutes. Action at previous meeting was to disapprove until proper license was obtained. Mr. Lewis is in the process of obtaining a special license to do these tests of small calibre arms on base. The license will specifically state how these items are to be used and what precautions are to be taken. Firing must be postponed until license is received. Committee will discuss again upon receipt of license.

(4) Ref par 2.e. of minutes of 22 Oct 69 meeting. The training or education program for licensed users of x-ray diffraction units and/or equipment as suggested by Dr. Eller in last meeting was discussed further. Dr. Gilbert and Mr. Lewis will get the film, check with personnel for those required to attend, set-up the meeting. In the meantime Col Dybvad will discuss this matter with General Williams in order to get the required individuals relieved from duty for the necessary length of time to attend the briefings.

(5) Mr. Lewis advised that letters have been distributed to all our users attempting to update the approved users of radioisotopes. The problem lies in the fact that there are so many users it is difficult to keep up with all personnel changes. They expect to have the list current within the next two weeks, which would simplify the notification of users to attend the above mentioned film. The possibility of requiring a periodic RCS report

or a run-off from Personnel to update these lists was discussed. Mr. Lewis will check into this matter further.

(6) Reference RHC 69-32 and 69-44, para 2.c.(1*) and (29) of 22 Oct 69 minutes. Mr. Lewis has received amendment to license to allow unlimited testing on above alloys with up to 4% thorium. Item approved as requested.

c. Review of requests for On-Base Use of Radioisotopes and/or Radiation Producing Apparatus:

(1) RCH 69-46

Request from Jam William F. Mac Kenzie, MRTP

For: Authority to use Cr^{51} and Fe^{59}.

Committee Action: These radioisotopes are to be used to measure blood volumes in animals on experiment in Building 79. Nineteen animals are to be tested, 10 dogs and 9 monkeys. The dosages injected into the dogs will be 12 microcuries of Cr^{51} and 5 microcuries of Fe^{59}. The dosages in the monkeys will be 4 and 2½ respectively. Total to be used is 500 microcuries of Cr^{51} and 200 microcuries of Fe^{59}. The isotopes will be obtained from Squibb & Co. The labeling procedures will be done in Room 171, Building 79. The urine and feces from the animals are flushed with large quantities of water into the sewage system. During necropsies all blood will also be washed into the sewage system. The carcasses will be incinerated at the Vivarium, Building 838. Capt Wilbur Sappington of the Chemical Hazards Branch will monitor the program and Miss Marilyn George of the Toxicology Branch is authorized to use radioisotopes. Prior secretarial approval has been given. Item approved as requested.

(2) RHC 69-47

Request from Capt Alvin B. Broderson, MRBV

For: Authority to use X-ray Cinematography Unit.

Committee Action: Approval is requested to operate MRBV x-ray cinematography unit under the constraints listed below. Installation and initial operation of the device was approved 27 Apr 65 and its description was included in the request for approval dated 26 Mar 65. The device has not been in use for over a year. Approval is sought to evaluate its usefulness for contemplated studies of internal organ motion during vibration using only nonhuman subjects. This will require changing the former configuration to the extent that a moving picture camera will replace the television camera, new image intensifying

screen will be tried, and movies of metallic test patterns will be made while experimenting with various combinations of intensifying screen and high speed film. No tests with either human or animal subjects will be conducted unless specifically requested and approved at a later date. The unit will be mounted on the Mercury shake table in NW corner of Bldg. 824. The three responsible users will be Capt A.B. Broderson, Capt. D.L. Wilburn and Mr. J.B. Carmichael. Surveillance of operation has revealed that they will be required to operate the unit at a higher voltage and amperage than that which would permit safe occupancy in non-restricted areas adjoining. They are not up to the operating voltage they want and are already bordering that permissible in non-controlled areas. Mr. Lewis stopped operations until Capt. Broderson can give us the maximum amperage and voltage at which he wishes to operate this unit whereby we can calculate the dose and required shielding. Prior to re-submission for approval Mr. Lewis will work with Capt Broderson to establish what the levels are when they reach their maximum level of operation and that they meet the criteria for shielding. Item disapproved until above requirements are met.

(3) RHC 69-48

Request from Dr. R.J. Spry, MAYE

For: Authority to possess and use radioactive material.

Committee Action: Materials Physics Div, Electromagnetic Materials Branch will use and procure the radioactive materials. Mr. R.J. Spry will serve as supervisor and Mr. Henes of the University of Dayton will serve as technician. Radioactive materials will be produced by thermal and fast neutron bombardment of germanium and silicon crystals. The germanium and silicon samples are solid single crystals and are extremely stable. The crystals are not hygroscopic and will not turn to powder. Trace impurities are present within the crystals and are estimated to be less than 1 part per million for each trace element. The most probable impurities are phosphorous, boron, antimony and arsenic. An experiment will be performed with the samples after each irradiation. Hence, a total of ten separate experiments shall be performed over the twelve month period. The radioactive materials will be stored in a lead pig or suitable lead bin in room 203 of building 433. Experiments will also be performed in this location. No radiation monitoring equipment is presently available. Rubber gloves will be used during the handling of the samples in order to insure against the possibility of spreadable activity. No potential hazards other than the activity and exposure rate of the radioactive samples. The maximum exposure rate is estimated to be 66.0 mR/hr at one foot. Assuming a gamma energy of 1.0 MeV, a 2.0 inch thick lead pig will reduce the maximum exposure rate to 1.2 mR/hr at one foot. They are presently on the film badge program. Prior to receipt of material the crystals will be monitored by individuals from NEC. Before NEC releases any material to any organization on Base they call Base Health Physics, giving them their readings and request approval to proceed.

Health Physics are not concerned about the radiation levels but have some concern about spreading contamination. Item was approved with the stipulation that proper coordination is established between NEC and Base Health Physics prior to transfer of material and that Dr. Spry have available during handling of the material a means of monitoring the radiation levels.

(4) RHC 69-49.

Request from Mr. H. Crockett, AVNE.

For Authority to possess and use Photometer manufactured by Nortronic Div, Northrup Corp.

Committee Action: A radioactive source is contained in this photometer. The photometer is used to measure the intensity of the daytime sky background. The source is used as an internal calibration source for the photometer, and contains Tritium Radioisotope in the amount of 190 mc. This instrument will be used at the Celestial Guidance Research Lab, Bldg. 846. The only users will be Hayden Crockett and Larry Reitz and both have limited experience in handling equipment containing radioisotopes. Mr. Becker is the area technical manater. After two attempts to get an AF permit Mr. Lewis was advised by the AF reviewing personnel that this unit does not require an AF permit, that it will go on our license. Mr. Crockett will be informed that he must submit a formal request to have this item placed on our license. Mr. Crockett has been instructed on the handling of the unit and it has been picked up on our inventory. Health Physics monitors and at no time has there been a loss of light from this unit, which would be the first indication of a leaking source. Item approved subject to receipt of request to include this unit on our license, and that request contains nothing different from that discussed. If there are any conditions other than what the Committee has agreed upon, Committee will discuss at the next meeting.

(5) RHC 70-1 (69-50)

Request from Mr. George R. Jenkins, AFIT-H

For: Authority to receive radioactive material.

Committee Action: 1 millicuries of Be^7 (T $\frac{1}{2}$=53 days) in 0.5 N HCl solution is to be used as a tracer in a project with AMRL to study the toxicity of Be^{++} on fish. The AF interest is due to the Be present in propellents. A series of two liter volumes will be prepared with $BeSO_4$ in solution in the concentration range of 0.1 to 100 mg. of Be^{++} per liter. Microcurie Be^7 tracer will be added to ascertain the uptake of $BeSO_4$ by the fish. The fish will be monitored as they live and die. The work will be done in the Medical Bldg. 79 because of the need for temperature control. AFIT-AFNEC will assist in making the solution, counting and spiking.

Prior secretary approval has been given. Item approved as requested.

(6) RHC 70-2

Request from Col Lawrence T. Odland, HRG.

For: Change of individual user and alternate user of radioisotopes.

Committee Action: Col Odland requested that Lt Col Luther W. Shatterly be designated "Individual User" vice Maj John C. Taschner, and 1st Lt John J. Gapsis be designated "Alternate" vice Capt Michael J. Moran, for all radioactive material listed in Inventory of Radioactive Materials and Ionizing Radiation-Producing Apparatus, as shown on the inventories from HRG dated 2 Dec 69 for unsealed sources, and 22 Dec 69 for sealed sources. Resumes of training and experience for both Lt Col Shatterly and 1st Lt Gapsis--reviewed by the Committee and on file in the Health Physics Unit--show them to be well qualified. Item approved as requested.

(7) RHC 70-3.

Request from Dr. Robert E. Sievers, ARC.

For: Authority to procure and use a detection instrument which employs a radioactive source.

Committee Action: The instrument will be used at the Chemistry Research Laboratory, Aerospace Research Laboratories, Bldg. 450, Rm A209 under the supervision of Dr. Robert E. Sievers by Drs. Kent J. Eisentraut and Mary F. Richardson, Mr. James E. Schwarberg and Charles W. Harris, and Capts Wayne R. Wolf, Deborah Johnson and Ashley S. Hilton. The instrument employs a detector with a Nickel 63 source in the form of a ceramic and stainless steel foil coated with nickel which has an activity of 2 millicuries. The radioactive source will be used as a detector in a Hewlett-Packard Series 402 Gas Chromatograph. The detector housing is a sealed unit which completely encloses the source and is a gas flow-through cell. The effluent gas will be vented directly to a hood. The unit will be located in a well-ventilated laboratory. No contamination problems are anticipated. All personnel involved have graduate degrees in chemistry or related sciences. Routine surveillance will be maintained by the Health Physics Unit. There is room on our license. Item approved as requested.

(8) RHC 70-4

Request from Capt Michael Taylor, MRTC.

For: Authority to possess and use radioisotopes.

Committee Action: The Varian Aerograph Model 2100 Gas Chromatograph will be located in Area B, Bldg. 79, Room 179. Two hundred fifty millicuries of tritium are employed in electron capture detectors to be used with this unit. Metal foils impregnated with a tritiated compound are contained in a stainless steel cylinder which will be installed within the unit. A total of three 250 millicurie foils are contained in this order. This unit will be employed to quantitatively detect and identify various organic compounds. The tritium is used in the detector to provide a source of ionizing radiation which is utilized in electron capture method of detection. Under normal operating conditions the detector cell will not be removed from the instrument and thus exposure to harmful levels of radiation is precluded. As required by the AEC, a high temperature limit switch will be installed in the detector compartment to insure safe operation. The detectors for which this authority is requested will be used simultaneously with identical detectors already previously approved for use on this multicolumn instrument. No radiation monitoring equipment is required. Users are already approved and are alert to the procedures.Item approved as requested.

d. OI 122-9 dated 2 Sep 69 documenting the procedures to be used in reporting nuclear reaction/radioisotope system accidents and/or incidents in the event of their occurrence at the AF NEC was given to the Committee members for their information and file.

JAMES W. LEWIS
Secretary, Base Radiological Hazards Committee

Approved 7 May 70

ROBERT L. WRIGHT
Colonel, USAF
Vice Commander

F16

Minutes of the 78th Meeting

of the

Base Radiological Hazards Committee

1. The Base Radiological Hazards Committee met in conference room 227 Building 10, Area C at 1330 hours, 17 June 1971. The following members were present:

Lt. Colonel William R. Dybvad (Chairman)	2750/SE
Mr. J.W. Lewis (Secretary	Med Cen/AMB
Dr. H. J. Hennecke (Member)	ARL/LG
Dr. George John (Member)	AFIT/ENP

2. Items of business conducted were as follows:

a. Old business:

(1) Reference RHC 68-20. Final disposition has been made of the Co^{60} source. It has either been shipped to the Corps of Engineers or disposed of as radioactive waste.

(2) Ref para 2 e of 22 Oct 69 meeting minutes and para 2.c. (2) of 15 July 70 meeting minutes. Mr. Lewis has not yet been able to locate an appropriate film, they are either too elementary or do not apply. Lt Col Dybvad will ask the National Safety Council for a listing of any films they may have on medical/industrial X-ray operation safety. If nothing can be located through the above source then correspondence will be directed through proper channels to MAC requesting a suitable film be produced.

(3) Reference para 2.f. of minutes of 15 July 70 meeting and para 2.a. (5) of minutes of 28 Jan 71 meeting. The problem with PMEL still exists. Lt Col Dybvad stated that a meeting with PMEL was held subsequent to our 28 Jan 71 meeting and that we better understand PMEL's problem. Our PMEL has a 100 millicuries C_s 137 source, any instrument that exceeds the dosage emitted by this source must be sent to Newark. Newark is responsible for the entire eastern part of the United States and have a tremendous workload. There is a gross problem in getting spare parts for non-FSN items. The Base Commander and the DM have been briefed. Mr. Lewis stated that although there had been some improvement, the problem is still serious. He added that they had had two instruments in PMEL since September of 1970 which had been returned to the manufacturer for replacement parts. There is still a credibility gap between PMEL and the user. Mr. Lewis was directed by the Committee that he

and Lt Col Dybvad will brief the Base Commander and work together in preparing correspondence to DM addressing the problem with PMEL and to AFLC addressing the problem at Newark, listing equipment that has gone in for calibration and the service we have gotten. Mr. Lewis added that he would like to see a 3-day turn over on most items. It will be further requested that the instruments be returned with a calibration curve, or chart, for each instrument showing the response to various energies.

(4) Reference para 2.d. of minutes of 15 July 70 meeting and para 2.a (6) of minutes of 28 Jan 71 meeting - Decommissioning of Nuclear Reactor. Telephone communications indicate that AEC will require licensing of the decommissioned Reactor site. However, no action toward application for license will be initiated until official notification from AEC of the requirement is received. The final inspection of the Reactor was made on the 17th and 18th of June and the results of this inspection will actually determine the direction of our efforts from this point. The 2750th will have primary responsibility for the building but it will be utilized by AFIT. Subsequent to the meeting Mr. Lewis was advised officially by AEC that the decommissioned Reactor will not need to be licensed, and that the entombed radioactive material will be the responsibility of WPAFB and the USAF Director of Nuclear Safety in accordance with the NUS Study #735 as amended.

(5) Ref para 2.b., minutes of 28 Jan 71 meeting - Storage and use of 50 curies of Ir^{192} for non-destructive inspection by the NDI/Corrosion Control Team. The source and license have been received and they are now utilizing the source on base. The plans are to notify the Fire Dept, Security Police and Health Physics of the work area. Storage will be in a vehicle procured for this purpose and proper safeguards have been taken to preclude unauthorized entry into this vehicle. AEC and Air Force have approved their procedures. AF/PRECT holds the license. WPAFB is concerned with storage and use on base. The vehicle will be parked outside Bldg. 1, Area C, when not in use and during off duty hours. The committee recommended that the vehicle not be parked outside unattended, even though secured, for any extended period such as after duty hours. Subsequent to the meeting, AF/PRECT agreed to investigate the use of an alarm system in lieu of parking the vehicle inside.

(6) Reference para 2.h. minutes of 28 Jan 71 meeting -- Review of By-Laws of Committee. Copies of by-laws were previously forwarded to all members of the Committee for review and recommendations at this meeting. However, since the Committee membership has dwindled due to transfer of a number of its members and only a minimum of the remaining Committee were in attendance, it was the consensus that this discussion be postponed until the Committee is up to full strength and is in complete attendance. It was recommended that the files be researched to determine those organizations with the largest inventory and consult with these organizations and other members for their recommendations for new members. It was recommended that Dr. Hagee of AFIT be made a full member, however, Dr. John of AFIT felt that it was not practical to have both he and Dr. Hagee at the same meeting in most instances. It was further suggested that the following be appointed

as members (or in some instances full members instead of alternates); Mr. Ralph Woodard, ARL/XP; Capt. R.P. Couch AFFDL/FDGL (alternate); Mr. Rudy Beavin AFFDL/FDGL; Mr. James Holloway AFML/LLN. In addition the organization will be contacted for members: ARL, AMRL, Material Labs, and ASD/SE.

b. Review of requests for on-base use of radioisotopes and/or radiation producing apparatus.

(1) RHC 71-1

Request from Henry C. Graham, ARL/LL

For: Approval for purchase of X-ray producing apparatus.

Committee action: Approval is requested for purchase of a standard electron probe microanalyzer/scanning microscope. The units under consideration have nominally a 30 KV electron beam accelerating voltage with a maximum electron beam current of 20 microamperes. The X-ray analyzer systems are constructed using standard techniques and safety precautions. Both units under consideration have been in use for several years and have proven to be completely safe to operate. This is a new user therefore, previous secretarial approval was not given. Item approved subject to checking of equipment and operating procedures by Med Cen/AMB.

(2) RHC 71-2

Request from Mr. Beavin, AFFDL/FGL.

For: Appointment of Capt Robert P. Couch to the Base Radiological Hazards Committee as an alternate member.

Committee Action: Captain Robert P. Couch, AFFDL/FGL has gained experience in handling radioisotopes and ionizing radiation producing machinery at the Rocket Propulsion Laboratory, Air Force Institute of Technology, and Air Force Flight Dynamics Laboratory, where he is currently assigned. He is presently a candidate for the PhD degree in Physics from AFIT. He has experience in the use of many sources of ionizing radiation, including Co-60, Am 241, Kr-85, etc., X-ray Machines, Electron Beam Heater, etc., in various applications. He is considered qualified to consider the appropriateness of planned uses of radiation producing sources, Approved as requested.

(3) RHC 71-3

Request from Major Alan B. Ashare, AMRL/EME.

For: Permission to procure and use radioisotopes.

Committee Action: The cardiopulmonary laboratory of the Environmental Physiology Branch, Environmental Medicine Division, 6570th Aerospace Medical Research Laboratory will procure and use the radioisotope. The supervisor is Alan B. Ashare, Major, USAF, MC, and the operational personnel include Anthony M. Smith, SSgt, USAF. Another technician will be assigned and his name will be submitted at that time. Technetium-99m is the radioisotope to be used. It is liquid obtained via a sterile, non-pyrogenic generator from its parent, molybdenum-99, as sodium pertechnetate. Each experiment will require, at most, 65 microcuries per pound body weight of technetium. This is the recommended activity for brain scanning in humans. The total amount of activity on hand at any one time will not be greater than 50 millicuries. Initially, the radioisotope as available from the USAF Medical Center, WPAFB will be used. As research progresses, AMRL anticipates purchasing their own technetium generator. Permission is requested to change the chemical nature to technetium sulfur colloid and technetium labeled chelate of diethylenetriaminepentaacetic acid (^{99m}Tc-Fe DTPA) via commercially available sterile, non-pyrogenic kits. No radiochemical procedures are involved. The radioisotope will be used to measure cerebral blood flow in animals. Technetium-99m will be administered by intravenous injection and detected by sodium iodide (thalium activated) probes placed near the cranial vault. The radioisotope, including generator, will be stored in room 111 of building 33. The storage and preparation of radioisotope will be the only activity in this room. The experimentation will take place in room 105 and the gondola of the Dynamic Environment Simulator (DES - human centrifuge), both located in building 33. AMRL will procure the required monitoring equipment deemed necessary. The radioisotope will be transferred by use of needle and syringe. No pipetting will be necessary. There is always the possibility of dropping and breaking a glass syringe, thus releasing the activity on the laboratory desk or floor. This can be diluted with water at hand. The generator will be properly shielded with lead. Approval of this request will be contingent upon the use of the Hospital source and we will require notification of intent to procure their own source. However, approval is withheld pending receipt of further information on: precautions taken in transport of material, precautions taken in preparation of the syringe, where material will be stored and used, disposition of wastes, whether animal waste will contain isotopes, decontamination procedures, monitoring devices procured, type of desk tops and other furniture to be used, disposition of dead animals. Subsequent to the meeting, the above requested information was received by letter from AMRL/EME (Atch 1) and copies forwarded to the members of the Committee for their approval. Mr. Lewis received written approval from Lt Col Dybvad, Dr. John, Dr. Hennecke and Mr. Beavin; therefore, this item is approved as requested with the exception that at the time AMRL decides to purchase their own source they must have previous approval from this Committee for the procurement.

3. Meeting adjourned at 1505.

JAMES W. LEWIS
Secretary, Base Radiological
Hazards Committee

1 Atch
Cy ltr AMRL/EME 23 Jun 71
Use of Radioisotope, Addendum
(AMRL/EME Ltr, 16 June 1971)

APPROVED/~~DISAPPROVED~~

E. A. RAFALKO
Brigadier General, USAF
Commander

Minutes of the 79th Meeting

of the

Base Radiological Hazards Committee

1. The Base Radiological Hazards Committee met in room 225, building 10, area C at 1300 hours, 30 September 1971. The following members were present:

Lt Colonel William R. Dybvad (Chairman)	2750/SE
Mr. J.W. Lewis (Secretary)	Med Cen/AMB
Dr. H.J. Hennecke (Member)	ARL/LG
Mr. Ralph E. Woodard (Member)	ARL/XP
Mr. James A. Holloway (Member)	AFML/LLN
G. Richard Hagee (Alternate)	AFIT/ENP
Dr. S. Gilbert, Jr. (Member)	Med Cen/HE
Mr. Frank Edinger (Member)	ASD/SE

2. Items of business conducted were as follows:

a. Old business:

(1) Minutes of 78th meeting were read and approved with the following exceptions:

(a) Ref par 2.a.(1) (page 1)- Second sentence should read: "It has been shipped from Wright-Patterson AFB; a portion to the Corps of Engineers for their use and a portion to the burial grounds at Maxey Flats, Ky."

(b) Ref par 2.b.(3) (page4) Line 28--Delete: "There is always the possibility of dropping and breaking a glass syringe, thus releasing the activity on the laboratory desk or floor. This can be diluted with water at hand."

(2) Reference par 2.f. of minutes of 15 July 70 meeting, par 2.a.(5) of minutes of 28 Jan 71 meeting and par 2.a.(3) of 17 Jun 71 meeting. Mr. B. H. Lehemenkuler, 2750th/DMMFCC, briefed the Committee on the situation at PMEL. He advised that they had just gone through a recertification exercise and failed. He explained that he is allowed to have two sources, the Plutonium 239 and Cesium 137. Any instrument that would require high level calibration would have to be sent to one of the four depots in the United States who do this. In our area it is Newark, Ohio. He had 401 items on inventory that are required to be sent to Newark and 96 which he can support himself. Items that have been sent to Newark within the last 6 months have been put on inventory and will be regularly scheduled for calibration. The T.O. 11H series covers the intervals at which the items are required to be calibrated. Newark will only calibrate items in good repair, anything requiring repair will be returned to us for repair or forwarded to

SAAMA for repair. Mr. Lehmenkuler advised that if a piece of equipment is needed quickly and he is so advised, he can put it on a priority basis and provide a 2 or 3 day turn around time. For equipment going to Newark, some of the problem lies in transportation; depending upon the size of the equipment, there can be a week or two involved in getting it out of Supply and to Newark. Mr. Lehmenkuler would estimate a realistic turn around time for equipment going to Newark of 30 days. Mr. Lehmenkuler advised he needs a list of equipment by types of everything on base. Lt. Col. Dybvad stated that it appeared there are 3 basic problems: (1) Calibration intervals; (2) Calibration procedures, that is, they are calibrating the instrument according to procedures but the calibration does not cover the range for which a specific instrument is utilized and is therefore not reliable; (3) Transportation. Mr. Lewis and Mr. Lehmenkuler will send a letter to all units operating this type of instrument requesting a complete listing of all instruments possessed, type of radiation and energy range the instruments are to monitor, and a realistic time that the user can conveniently work without his equipment. In connection with this problem, Mr. Lewis advised that in order to comply with an AFLC IG write-up he requested to the AEC that our license requirement to calibrate instruments at quarterly intervals be changed to six month intervals as is required by AF regulations and T.O.s. If the quarterly interval is retained then this would double the PMEL Radiac workload. Mr. Lewis is awaiting clarification on this point. Mr. Lehemenkuler will persue the transportation problem with the D.M. when he has received response to his letter. With the above actions it is believed this item can be closed for the present. If further actions should be required or if it is later felt that action should be pursued to obtain additional sources at PMEL to preclude sending the equipment to Newark, this item will be re-opened. CLOSED.

(3) Ref par 2.e. of 22 Oct 69 meeting minutes and par 2.c(2) of 15 July 70 meeting minutes. Mr. Lewis has located an appropriate film and training of x-ray operators will proceed. CLOSED.

(4) Reference par 2.d of minutes of 15 July 70 meeting, par 2.a(6) of minutes of 28 Jan 71 meeting, and par 2.a(4) of 17 June 71 meeting. Decommissioning of Nuclear Reactor. Mr. Lewis advised that the decommissioning of the Nuclear Reactor has been completed as scheduled, however, during follow-up investigation, they found water under the Bulk Shield Facility (BSF) liner. Major Frederick Buoni, Hq USAF, AFTAC/NYRP, Alexandria, Va. and Capt. Bruce A Wilson, AFRRI/PSAD, National Naval Med Ctr, Bethesda, Md., were requested to visit the Reactor to evaluate this situation. Their analysis revealed three areas of concern: Water seepage into the entombment area, residual water in the BSF and Fuel Storage Pit, and penetration of ground water into the containment shell via a breach of containment. Their recommendations, were: a. The concrete exposed by the removal of two sections of the aluminum liner.

This area should be dried and carefully monitored for further moisture accumulation. Any water found should be analyzed and compared with the samples already obtained. b. They do not consider venting of the entombment structure to be advisable at this time. However, as a precautionary measure it should be historically documented that venting will be required prior to any disassembly operations on the entombment structure. Finally they advised that they found no conditions which would appear to alter conclusions reached in the AFNEC Decommissioning Safety Analysis with regard to safety of the plant. Mr. Lewis advised further that they have complied with all recommendations. Essentially, the water seemed to dry up overnight in the BSF portion. The pit area did not immediately dry. After about four weeks Mr. Lewis placed heat lamps over the open section of the pit and this dried up the exposed area over the week-end, however, there is still water under some unexposed areas. He is now heating the aluminum and it appears to be drying up, in spite of the rainy weather. A sample of the water was sent both to Kelly AFB and to a local firm for chemical analysis. They do not agree on their analysis. Mr. Lewis is holding two gallons of water should it be needed later CLOSED.

(5) Ref par 2.b., minutes of 28 Jan 71 meeting and par 2.b.(5), minutes of 17 June 71 meeting. Storage and use of 50 curies of Ir^{192} for non-destructive inspection by the NDI/Corrosion Control Team. Storage is in a special vehicle procured for this purpose. To insure detection should the vehicle be tampered with a radio-wave type of alarm system is being procured. This item is to be held open pending installation of alarm system.

(6) Review of By-Laws of Committee. Copies of by-laws have been given to all members of the Committee for review and recommendations. Members are requested to return their comments to Mr. Lewis prior to 1 December 1971. Mr. Lewis and Lt. Col. Dybvad will meet a week prior to the next meeting and prepare a final draft of the By-Laws and present them to the Committee at the next meeting.

b. New business:

(1) Review of requests for on-base use of radioisotopes and/or radiation producing apparatus.

(a) RHC 71-4
Request from Robert E. Sievers, ARL
For: Permission to procure and use Picker FACS-1 X-ray Single Crystal Automatic Diffractometer.
Committee Action: This instrument will be used by the Chemistry Branch, Inorganic and Analytical Group, ARL, Bldg. 450, Room A114.

Dr. James A. Cunningham will supervise the operation of the instrument and will be the sole operator at the present time. Authorization for other users will be requested as appropriate. Dr. Cunningham has a Ph.D in chemistry and is employed as an x-ray crystallographer at ARL. He has previously operated and has had the responsibility for similar x-ray equipment at three other laboratories. He has not previously been approved for the use of x-ray equipment by the Radiological Hazards Committee. The experiment will consist of directing an x-ray beam onto various sets of planes in a single crystal, and measuring the intensity of the x-ray beam which is reflected from these planes. The data thus generated by this instrument will be used to determine the structures of compounds of an atomic scale. A Victoreen 444 ionization chamber is currently used to monitor x-radiation. Mr. Lewis advised that complete reliability on the automatic shutters designed in this piece of equipment is unwise. It is not uncommon to find leakage and beaming in such a way that it could be deterimental. Periodic routine checks by Mr. Lewis and checking after installation and maintenance on the unit will be required. SOPs are to have been developed and posted. This item is approved pending receipt of satisfactory operating procedures by Mr. Lewis.

(b) RHC 71-5

Request from Dr. Hans J. Hennecke, ARL/LG

For: Permission to produce F^{18} for H.E.W. by the ARL Tandem Accelerator

Committee Action: Permission is requested by ARL/LG for production of the radioisotope F^{18} for the Nuclear Medicine Lab, Cincinnati General Hospital, Cincinnati, Ohio. This laboratory is an element of the Bureau of Radiological Health, Environmental Control Administration under the U.S. Department of Health, Education and Welfare. Planned production is about 20 millicuries of F^{18}, which has a half-life of 1.87 hours and wholse principle radiations are .65 MeV B^+ and 1.67-MeV gamma rays. The activity will be produced via the Ne^{20} (d,a)F^{18} reaction. ARL/LG will provide a deuteron beam of 6-7 MeV energy and 10 microampere current from the Tandem Accelerator. The Nuclear Medicine Laboratory will provide a 12" long gas target chamber with .001-inch thick x 1.0 inch diameter aluminum foil entrance window. Expected irradiation times are 10-60 minutes/experiment with 5-10 experiments planned over the period 1 October 1971 - 1 January 1972. The interaction of the deuteron beam with the aluminum entrance foil produces an additional activity via the Al^{27} (d,p) Al^{28} reaction. The Al^{28} decays with a 2.3 minute half-life and has principle radiations consisting of 2.87-MeV β^- and 1.78-MEV Y-rays. Following the deutron irradiation period, the Al^{28} activity of the entrance foil of the gas chamber is allowed to decay for a period of 15-30 minutes. The chamber is removed from the accelerator beam tube by means of a quick-disconnect vacuum flange. The chamber is then transferred to a lead storage container

in the back of an H.E.W. authorized vehicle. Handling of the chamber is done by 30-inch tongs. Mr. Kenneth Scholz and Dr. Vincent Sodd, Deputy Chief of the Nuclear Medicine Laboratory will handle the target chamber and transfer it to Cincinnati. Dr. Hans. J. Hennecke, Dr. Gale I. Harris and Mr. W. Anderson from ARL/LG will assist in the irradiation. Dr. Hennecke will be the responsible ARL/LG radioisotope user. This material is not included under our license. A statement has been received from the H.E.W. indicating that they assume full responsibility for the material while in transit and use. Item approved as requested.

(c) RHC 71-6
Request from Robert G. Hendricks, AFIT/ENP
For: Permission to possess and use an additional 100 MC of CO 57.
Committee Action: AFIT/ENP needs to replace a Mossbauer source that has decayed to a level of activity too low for their application. The older source will be retained for use as a calibration source. The new source made by the New England Nuclear Corp would be similar to the older source we have been using except that the initial activity would be 100 millicuries of CO 57 diffused into palladium foil. The activity would have an active diameter of 1/4 to 1/2 inch on palladium foil of larger diameter. The foil is to be mounted in a $1\frac{1}{2}$ inch diameter plastic ring and used in our Mossbauer apparatus to study certain materials effects. This work will be performed under the supervision of Dr. George John by an AFIT thesis student, Captain Whited, in Room 66, Bldg. 640, Area B. Item approved as requested.

(d) Mr. Holloway read to the Committee a message he had received that, although sent to him by mistake, could provide this Committee with food for thought. The message was from TAC and reads as follows: "Subject: Industrial Radiation Discrepancies. (1) Review of radiographic protection survey reports disclosed x-ray operation, installation, and equipment discrepancies that are of concern to TAC. To our knowledge action taken to correct the discrepancies or to nullify the requirement causing the discrepancy has not transpired. Following is a brief description of the major x-ray protection discrepancy and the appropriate reference: A. Industrial x-ray generators control consoles are not provisioned with the required key lock (Ref to 33B-1-1, par 9-86D(1) and survey report 70W-101. B. Both the 160 KVP and 275 KVP x-ray tubehead exceed radiation leakage limits established in NBS handbook 93 and MIL-X-19847A. Radiation tubehead leakage as high as nine roentgens has been reported. Irradiation of this intensity not only possess a potential personnel hazard but also degrades definition of the object image. It is imperative both from quality and safety to insure X-ray generators (Magnaflux) programmed into AF inventory adhere to tubehead leakage requirements and existing x-ray generators (Sperry) are modified to reduce tubehead leakage below established tolerances. C. Survey reports include the recommendation that enclosed radiation installation be provisioned with alarm and key lock devices. These recommendations are opinionated in nature

and do not represent radiation requirements in TO 33B-1-1. Ref reports 70W-101, 71W-31 and 71W-95. (2) Request this Hq/LGMS be advised of action taken to correct discrepancies that continually appear in our NDI radiation facility survey report. TAC/LGMS does not support modification of equipment or facility to comply with radiation discrepancy corrections noted in par 1A and 1C of this message."

Committee Action: It was the opinion of the Committee that James Lewis survey the pieces of this type equipment at Wright-Patterson to determine that we do have proper shielding and/or procedures to insure adequate protection against radiation.

Meeting adjourned at 1500 hours.

JAMES W. LEWIS
Secretary, Base Radiological
Hazards Committee

APPROVED/~~DISAPPROVED~~ 22 NOV 1971

E. A. RAFALKO
Brigadier General, USAF
Commander

AMB

Source Disposal

USAF Radiological Health Lab/CC/Maj. Furtado

1. In response to your request for information regarding disposition of Co^{60} irradiator sources licensed under AEC License No. 34-00472-05 the following information is provided:

a. Item 6A Co-60, 50,000 ci(BMI) and Item 6D Co-60, 15,000 ci(BMI) were disposed in the following manner; Eight of the original 15 elements were transferred to Florida Institute of Technology, Melbourne, Fla. on 18 Feb 71. Seven of the elements were shipped to Nuclear Engineering Co. Morehead Ky on 1 Mar 71 for burial as waste (See Atch 1) para 1(a) and 1(b)).

b. Item 6c, Co-60 1550 ci, Brookhaven National Lab was shipped for burial 5 April 71 to Nuclear Engineering Co. (See Atch 2)

c. Item 6E, Co-60, 10,000 ci, AECL was shipped for burial to Nuclear Engineering Co. on11-3 Mar 71. (See Atch 1 para 1 (c) and 1 (d).

FOR THE COMMANDER

ROBERT J. WOODHOUSE, Capt, USAF, BSC
Health Physicist

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO ATTN OF: NEH

5 March 1971

SUBJECT: Transfer and Disposal of Licensed Radiation Sources

TO: USAF Med Cntr/AMBP
Attn: Secretary, Base Radiological Hazards Committee

1. The following disposition of radiation sources licensed under AEC Byproduct Material License 34-00472-05 is reported for your action:

a. Eight (8) Co^{60} elements (BMI), total activity of 27,520 curies, were transferred to Florida Institute of Technology, Melbourne, Florida on 18 Feb 1971 for their use under Florida License No. 651-1.

b. Seven (7) Co^{60} elements (BMI), total activity of 24,080 curies, were shipped to Nuclear Engineering Co., Morehead, Kentucky on 1 Mar 1971 for burial as waste.

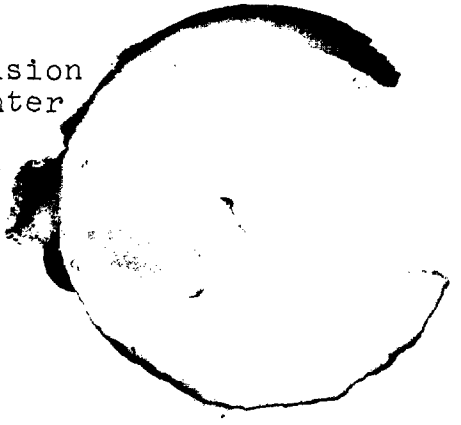
c. Twenty (20) Co^{60} rods (AECL), total activity of 3915 curies, were shipped to Nuclear Engineering Co., Morehead, Kentucky on 1 Mar 1971 for burial as waste.

d. Twenty (20) Co^{60} rods (AECL), total activity of 3915 curies, were shipped to Nuclear Engineering Co., Morehead, Kentucky on 3 Mar 1971 for burial as waste.

2. These transfers remove from WPAFB possession all byproduct material listed in items 6.A., 6.D., and 6.E. of License No. 34-00472-05, as amended.

George R. Jenkins, Jr.

GEORGE R. JENKINS, JR.
Chief, Health Physics Division
AF Nuclear Engineering Center



NUCLEAR ENGINEERING COMPANY, INC.

EASTERN OPERATIONS
P. O. BOX 146
MOREHEAD, KENTUCKY 40351
PHONE (606) 784-7526

CERTIFICATE OF ULTIMATE DISPOSAL

This is to certify the Nuclear Engineering Company, Morehead Nuclear Service Center, did this day bury and concrete in place the following described radioactive sources:

Seven (7) elements, 13-1/4" long x 1" wide x 1/4" thick, approximately 24,360 curies.

Forty (40) elements, 7/16" diameter x 13-1/2" long approximately 5,640 curies.

The disposal is authorized under Kentucky License 16-NSF-1 and amendments thereto.

B. V. Roberts

B. V. Roberts, Manager
NUCLEAR ENGINEERING COMPANY, INC.

March 5, 1971
Date of Burial

EXECUTIVE OFFICES
P. O. BOX 4308

RADIOLOGICAL HAZARDS ADVISORY COMMITTEE

Minutes of the Sixth Regular Meeting, 1 February 1956

The sixth regular meeting of the Radiological Hazards Advisory Committee was held in the Office of the Surgeon, Hq Air Materiel Command, Building 262, on 1 February 1956. The following persons attended the meeting:

Lt. Colonel J. C. Carmichael	(Chairman)	- Engineering Branch, Surgeon's Office, Hq AMC
Major Charles B. Marshall	(Acting Member)	- Office of the Base Surgeon
Major W. E. Harlan	(Alternate)	- Operations Branch, Hq WADC
Mr. E. A. Sharp	(Member)	- Plans & Coordination Office of the Base Commander
Dr. William J. Price	(Member)	- Institute of Technology, USAF
Lt. E. A. Burke	(Tech. Advisor)	- Materials Laboratory, Hq WADC
Lt. D. E. Barber	(Secretary)	- Engineering Branch, Office of the Base Surgeon

The following is a record of actions taken and business transacted at this meeting:

I. Minutes of the Previous Meeting

Minutes of the fifth regular meeting were omitted.

II. Old Business

It was suggested that Lt. Barber present a report to the Committee at its next regular meeting, relative to the status of the Base Health Physics Program, specifically outlining the problems encountered in personnel and equipment procurement.

III. New Business

A. Discussion of Command Level Advisory Committees

1. Colonel Carmichael offered the following comments:

a. A letter to the Department of Defense revealed that no policy has ever been published regarding the procurement, monitoring, and handling of radioactive materials.

b. A letter from Headquarters USAF in September of 1955 requested the opinion of the Surgeon's Office, Hq AMC, and suggested that an advisory committee be established by each command with the decisions of the separate command committees subject to final approval by a similar committee at Headquarters USAF.

c. Air Materiel Command's counter proposal to Headquarters USAF suggested that AMC be established as the final reviewing authority of all radioactive isotope requests for the entire Air Force. Washington's request would involve some 17 separate committees which would unduly complicate procedures and delay procurement.

d. Air Materiel Command's proposals were accepted by letter in December 1955 with the provision that the separate commands could establish separate committees if they so desired, but that AMC would be the final reviewing agency. Although command committees are not established, command channels will be used.

2. Two plans for reorganization were suggested, the second of which will most probably be approved.

a. The W-PAFB committee and the Hq AMC committee would be one and the same.

b. The present committee, with the exception of Colonel Carmichael in whose place a new member would be designated, would serve as the base committee, and the Hq AMC committee would be newly organized.

3. It was pointed out that the Hq AMC committee ~~will represent~~ WAS PROPOSED AS THE OFFICIAL LIAISON BETWEEN the Atomic Energy Commission ~~in~~ AND all ~~requests from~~ Air Force installations ~~for~~ RELATIVE TO isotope procurement.* Regulations on organization of the committee will be drafted. To date, it appears that the following offices will be represented in the Hq AMC committee:

a. Two offices in Maintenance
b. Two offices in WADC
c. Two offices in Procurement
d. Two offices in the Medical Service
e. SAFETY AND SUPPLY

B. Discussion of Isotope Procurement

1. Mr. Sharp suggested that Procurement be requested to notify the advisory committee of all radioactive isotope requests they receive.

2. Lt. Burke pointed out that separate organizations which have been granted general authorizations for isotope procurement are able to obtain isotopes from the Atomic Energy Commission without the approval of the committee. This applies to nuclear and source material; the requests for which are handled by offices apart from those handling by-product material requests which are controlled by the advisory committee.

* THE HEADQUARTERS AMC COMMITTEE IS EXPECTED TO ASSUME AEC APPROVAL AUTHORITY IN THE FUTURE.

3. Organizations may also obtain isotopes from the U. S. Radium Corporation which has a general authorization for lending isotopes for a period of six months. However, in this case, the U. S. Radium Corporation is responsible for the material.

4. Mr. Sharp asked whether or not a statement of handling from the isotope user was required by the committee. In reply to this, Lt. Burke stated that the standard procedure was as follows:

a. An AEC Form 313 is submitted to the committee by the requesting organization.

b. A disposition form is required from the requesting organization stating local information.

c. The Secretary of the committee contacts the user for detailed information and prepares the preliminary radiation hazard evaluation.

d. The request and the hazard evaluation are discussed by the committee and are approved or disapproved.

e. Following the approval of the request, a disposition form is sent to the user stating the conditions of operation.

C. Luminous Markers on Aircraft

1. Colonel Carmichael asserted that markers containing approximately 50 microcuries of Strontium 90 are expected to be used on all aircraft of the USAF in the near future. He outlined the recommendations of the Office of the Surgeon, Hq AMC, which were sent, via letter, to the Surgeon General, USAF. The recommendations are as follows:

a. The markers will be procured by one installation.

b. The ~~surgeon~~ SUPPLY's office at each base will be accountable for markers not on aircraft.

c. A Maintenance officer will be held accountable for markers aboard aircraft as specified on DDF #780.

d. The location and number of the markers on aircraft will be recorded on DDF #780.

e. All aircraft will be identified by their serial numbers.

f. Every six months, the markers will be inspected by Maintenance personnel. Standard radiac equipment, used in conjunction with a dry wipe sample taken over the total exposed

surface of the marker will be adequate for detecting leakage. When such samples show a leakage of .005 microcuries (assuming 50% counting geometry) they will be replaced and the old markers returned to the issuing depot. Supply stores will have Maintenance personnel perform the same leakage test on all markers just prior to their issue.

g. The medical service will be responsible for performing an AEC leakage test as prescribed in AEC regulations. This test will be accomplished when the aircraft returns to the AMC depot for periodic maintenance and overhaul; which is about once every two to three years.

2. It was emphasized that all of the above proposals are subject to AEC approval after they are approved by Headquarters USAF.

3. It was also pointed out that Boeing Aircraft Corporation has been licensed by the Atomic Energy Commission to install subject markers in their aircraft, but that the Air Materiel Command has not been so licensed. Technically, the aircraft cannot be accepted by the Air Force until the Air Force is likewise licensed. However, this is not expected to present any difficulty.

4. Colonel Carmichael stated that in case of crash or fire, resulting in rupture of the markers, a contamination problem would exist. The aircraft would be nonstandard salvage and would have to be considered radioactive waste. Special procedures will have to be developed for aircraft accidents.

5. In answer to Dr. Marshall's question of responsibility of radiation survey in crash accidents, Colonel Carmichael stated that the using agency would be responsible.

D. Review of Radioisotope Applications

1. A request for a five curie Po-Be Neutron Source, submitted by Dr. W. J. Price, Physics Department, USAFIT, was reviewed by the committee. Since this request was identical to one which had been reviewed at a previous meeting, it was approved with little discussion save for the emphasis of the hazard which would result from rupture of the capsule. This was considered to be a very improbable event due to the structure of the capsule.

2. Requests for 100 millicuries of P32 and Irradiated Material involving Cr51 and Fe55, which had prior telephone approval of committee members, were discussed, along with the associated preliminary hazard evaluations, and approved. The requests were submitted by Lt. Burke of this committee who asserted that the recommendations in the preliminary hazard evaluations had been complied with.

E. Isotope Shipments

The question arose as to the advisability of using Wright-Patterson Air Force Base as a pick up point for radioactive materials being shipped to other Air Force installations, in particular to SAM, Randolph Air Force Base. Dr. Marshall suggested that a letter be sent to SAM requesting that they obtain their sources directly from the manufacturer.

F. Questions of Authority and Responsibility

To Lt. Barber's question concerning the line of authority and responsibility between the base and its tenant organizations, relative to radiological hazards, Colonel Carmichael stated that the medical service is responsible for monitoring of radioactive materials if the specific activity involved has no monitoring personnel. The activity's use of its own personnel for monitoring is contingent upon the approval of such personnel by the medical service.

G. Committee Membership

Lt. Donald E. Barber was appointed by the Chairman as the new Secretary of the Radiological Hazards Advisory Committee. It was agreed that Lt. Edward A. Burke would continue his participation in the meeting as a Technical Advisor.

Minutes Approved as
Corrected 6 April 1956

Donald E. Barber, 2/c USAF (MSC)
Secretary

MINUTES OF THE TENTH REGULAR MEETING OF THE RADIOLOGICAL HAZARDS ADVISORY COMMI

The tenth regular meeting of the Radiological Hazards Advisory Committee w held in the office of the Surgeon, Hq Air Material Command, Building 262 on the of August 1956. The following persons attended the meeting:

Lt. Colonel J. C. Carmichael, Chairman, MCDPE
Major A. Boreske, Jr., Alternate, WCOES
Mr. R. W. Yoe, Alternate, EWP
Dr. Andrews, Alternate, EWD
Dr. W. J. Price, Member, MCLI
Major John A. Peterson, Guest, MCD
2d Lt. Donald E. Barber, Secretary, EWDPE

The following is a record of actions taken and business transacted at the

I. The proposed agenda was adopted and the minutes of the previous meeting rea minutes were approved as read.

II. Old Business:

a. Discussion of Status of Enlargement of Committee

Mr. R. W. Yoe, who was the alternate for Mr. Sharpe at this meeting, re that the requested individuals had been added to the committee. He presented a of the orders to the committee for their review. Committee pointed out that th ividuals mentioned in the Letter Order Number 003430 were to be appointed as l members only, not as voting members of the committee. To be certain that this correct, DF dated 21 June 1956, from Lt. Colonel Carmichael to EWG was read. T referred only to liaison members. It was decided that the orders should be cha appointing the individuals as liaison members only. During this discussion, th tus of the chairman change in the committee was discussed along with the appoin of new members from the reactor group. Colonel Carmichael pointed out that it desire to be relieved of the duty as Chairman of the committee as soon as contr cedures are completely established under the new Broad Specific License. He st that a DF requesting appointment of a new member from the Nuclear Engineering T Facility group would be prepared and sent to EWG.

b. Preparation of Final Draft of Proposed Letter, Subject: "Radioactive (product) Material Control

Amendments to the letter as suggested by the members of the committee t secretary, were discussed at this meeting and the final draft prepared. The se tary was directed to transmit the letter to Mr. Sharp for preparation of the of letter for the signature of the base commander. It was pointed out that Colore should sign this letter, not the base plans office. During the discussion of t the question came up as to status of a proposed regulation for control of mate base. The chairman pointed out that Lt. Burke had prepared a rough draft of th lation, Dr. Andrews said that he was familiar with this draft and that he would in his files to see if said draft could be located.

III. Discussion of the Proposed Regulation on Radicactive Waste Disposal

The regulation as proposed by the secretary was approved by the committee

exception that paragraph b 6 and 7 should specify that arrangements should be ma the base radiological health officer and that specific mention should be made i graph i that the storage site location and construction should conform with rec ions of the Base Radiological Health Officer. The secretary was directed to p a final form of the regulation and transmit it through proper channels. It was ed that a DF from the secretary be written to the committee. The committee in would then submit an indorsement of this waste regulation in the form of a DF f chairman, to the secretary so that the files might be complete.

IV. New Business

a. Request for Approval of Personnel in Radiation Work from WCRTY-3

The committee did not feel that they should specifically approve these for work with radioactive materials as indicated in the DF. It was pointed out meeting that individual users as specified on AEC Form 313 are responsible for handling of radioactive materials. Approval of said request would in essence h lieved individual users of this responsibility; therefore, the committee refus proval in this form. The secretary was directed to return the DF to the organi with an explanation of committee's views.

b. Request for the Retention of "Isolites"

Request for retention of "Isolites" in possession of Mr. Kahn of WCLRF- submitted to the committee by the secretary for approval. It was pointed out t sources were leak tested and no detectable activity found. Committee approved for retention of the material.

c. Request for Irradiation Services

The request from WCRTY-3 for irradiation of organic aircraft materials viewed, discussed and approved. Since the new broad specific license limit of millicuries of any isotope from Atomic Numbers 3 - 83 inclusive applies to irra material, return approval to the Analysis and Measurements Branch should includ quest to that organization to submit its estimates of the activity of each elem involved in the irradiated specimen.

d. Discussion of Request for Purchase of Unenriched Uranium Salts

This request from the Analysis and Measurements Branch, WCRTY-1, was r discussed and approved at this meeting. This material is source material and t mittee has little jurisdiction over it. However, the application was approved committee with the provision that the last paragraph of the inclosed letter to Washington, D. C. be revised. The last paragraph of the letter read, "Upon com of these studies, this center can dispose of the uranium and uranium salts by b in the soil in accordance with regulation 10 CFR 20". It was pointed out that of radioactive materials at Wright Patterson Air Force Base is an unauthorized of disposal. It was recommended that this paragraph be changed to conform to t posed base regulation on radioactive waste disposal, if the Analysis and Measur Branch is not accountable to the AEC for all the materials and return of same.

e. Discussion of Control Procedures and Special Forms for Procurement of ctive Materials

Colonel Carmichael read the reply from the AEC to our letter of 7 Aug

to Lester E. Rogers concerning the use of AEC forms. In essence, the reply fro Rogers stated that the committee was not authorized and would not be allowed to EC licensing Forms. The committee did not believe that this applied to AEC Fo which is United States Atomic Energy Commission Isotope Order Blank for use by gencies only. It was decided that this form would be used as a licensing form individual requesting organizations. It was decided that this would be adequat provided purchasing and procurement were coordinated with and made familiar witl type of form. The chairman delegated Mr. Yoe to coordinate the use of this for cided at this committee meeting with base procurement and purchasing. The chai raised the question as to what particular type of directive would be required t procurement. It was suggested that a joint regulation might be appropriate. I decided that AEC Form 375, Item 9a would be revised to read "AEC License Number Wright Patterson Air Force Base License Number and that a stamp signifying comm approval would be placed in the conspicuous open space in Item 10 of the form s procurement could easily identify the request as approved by the committee. Th tire procedure will be discussed at the next meeting and specific procedures ou when Mr. Yoe has a report on procurement status.

f. Application for 12 Curies of Po-Be Neutron Sources

Dr. Price of the Physics Department, Air Force Institute of Technology quested approval for 2 Polonium Berryllium sources of 6 curies each. Dr. Price out that these sources were sources that were depleted beyond usefullness for t of Aviation Medicine in Texas. Rather than have these sources lost to the Air and since the USAFIT requires sources of just this strength, it was decided tha would be economical to obtain these sources from the School of Aviation Medicin request was discussed and approved.

g. The secretary brought to the attention of the committee that the commi recommendation of waste storage of unauthorized polonium 210 was being accompli WCLPG-3. He further pointed out that Mr. McGee of WLRW-2 is having authorizati "Isolites" now in his possession transferred from the supplier to his organizat Reference is made to last committee meeting in which he requested approval for tion of these sources.

h. The actions of Mr. Robert D. Thomas, Health Physicist of the Analysis Measurements Branch, Materials Laboratory, WADC were presented to the committee secretary who pointed out that Mr. Thomas has been doing an excellent job on th in that he has been going outside the limits of his branch in conducting radiol surveys. This has been of considerable service to the Base Radiological Health Mr. Thomas had requested authority by the committee authorizing him to survey a stallations in WADC. However, do to the status of health physics organization base, the committee did not feel that it was in a position to extend this autho It was felt that such a letter would present difficulties when action is initia establish the health physics operation as a base function only.

Approved as read
10 September 1956
Donald E. Bunker
Secretary, RHRC

MINUTES OF THE 44th MEETING
OF THE
BASE RADIOLOGICAL HAZARDS COMMITTEE

The 44th meeting of the Base Radiological Hazards committee was held on 5 September 1962, in the Conference Room, Building 40, Area B, at 0900 hours. Persons in attendance were as follows:

Major Richard E. Page - ASTEN - Chairman
Dr. George John - MCLI
Dr. Andrew C. Andrews - HWEM
Mr. David Lintz - ASTENH
Mr. Ralph Bishop - EWMSMS -3
Mr. Adell Kirk - HWEMA-1
Mr. Elmon M. Elmore - HWEMA-1 - Secretary

The following is a record of the business conducted:

1. A letter was read from Lt. Matin, the former Secretary to the U.S. Atomic Energy Commission requesting he be replaced by Mr. Elmore on the AEC licenses now held by the Base. Final action has not been received from the Commission.

2. A discussion was conducted concerning organizations on Wright-Patterson Air Force Base giving the Base license number to manufacturers to obtain radioactive materials. The committee was informed of such action by the Secretary and letters were read regarding the same. It was pointed out that some action should be taken to assure that this act will not occur again so as to put the Base license in jeapordy. A notice covering the above subject will be published in all daily bulletins on Base.

3. A letter from Atomic Energy of Canada Ltd was read inquiring about the status of the 25,000 Curie Co^{60} amendment. The Secretary was instructed to respond to the correspondence.

4. The following requests were approved by the committee:

a. Request to amend the USAF Hospital AEC license to include additional isotopes.

b. Request to transfer Po^{210}, Sr^{90} and Co^{60} from Lt. Matin to M/Sgt. Madison, Mr. Kirk and Mr. Elmore. (HWEMA-1).

c. Request to possess and use of Ra^{226} in a vacuum gauge from Mr. Baker (ASRURS-4).

d. Request for possession and use of Ra^{226} in static eliminators from Mr. Bishop. (EWBAPAD)

e. Request for possession and use of Radium D, E and F in solution as counting standards from Dr. John (MCLI).

f. Request for possession and use of two sources of Po^{210} 1250 microcuries and 300 - 500 microcuries from Dr. John (MCLI).

g. Request for possession and use of 65 curies of H^3 from Mr. Gatenbee (ASRMDD-11).

h. Request for possession and use of Co^{60} from Mr. Dempsey (MRVPP).

5. A request was received for possession and use of Fe^{57} from Dr. Emile Rutner of the Materials Physics Laboratory. It was pointed out that this isotope was not radioactive and therefore needed no authorization from the committee.

6. The meeting was adjourned at 1015 hours.

Elmon M. Elmore

ELMON M. ELMORE
Secretary, Base Radiological
Hazards Committee

Approved

R. H. Macklin

R. H. MACKLIN
Colonel, USAF
Deputy Commander

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